

Course Outline
ENG M 401 & 620 Section X1
Fundamentals of Engineering Finance
September 2011 – December 2011

Mondays, Wednesdays, and Thursdays from 5:00 PM to 5:50 PM
ENGM 620 Seminar Wednesdays 6:00 PM to 8:00 PM
in ETLC 1-003

This Course Outline is posted at:
http://www.ualberta.ca/~mlipsett/ENGM401_620/ENGM401_620.htm
And was last updated on September 6, 2011

Welcome to ENGM 401 & ENGM 620 Section X1.

This course outline provides the following information, as required by General Faculty Council (GFC) of the University of Alberta:

- 1) the course objectives and general content
- 2) a list of the required textbooks and other major course materials
- 3) a list of any other course fees as described in the 'Student Instructional Support Fees Policy' and their associated costs
- 4) an indication of how and when students have access to the instructor and teaching assistants
- 5) the distribution of weight between term work and final examination, and identification of all course activities worth 10% or more of the overall course mark
- 6) whether marks are given for class participation and other in-class activities as well as the weight of such participation
- 7) dates of any examination and course assignments with a weight of 10% or more of the overall course mark
- 8) the manner in which the official University grading system is to be implemented in that particular course or section, i.e., whether a particular distribution is to be used to determine grades, or whether there are absolute measures or marks which will determine them, or whether a combination of the two will be used. Instructors should refer to the University of Alberta Marking and Grading Guidelines
- 9) an indication of how students will be given access to past or representative evaluative course material.

In addition, this document provides an outline of the course schedule for lectures, assignments (including projects), and examinations (which are current as of the start of the course, but which may be subject to change); and how late or missed assignments and exams are dealt with in this section.

Policy about course outlines can be found in §23.4(2) of the University Calendar.

1) Course Objectives and General Content

Understanding and applying the fundamentals of engineering economics, financial analysis, and market assessment to formulating and assessing engineering alternatives in the planning, development, and ongoing management of industrial enterprises. ENGM 401 introduces the use of engineering, economic, financial, and market assessment information in investment and business operation decisions in technology oriented companies. ENGM 620 takes these approaches further by introducing additional concepts and applying them to a detailed case study valuations of existing, publicly trade enterprises.

This course is lecture based, primarily using slides in pdf format, which will be made available in advance from the course on-line site (e-class in 2011). These lecture slides are supplemented with notes for selected discussions, and with in-class spreadsheet and problem-solving examples. Required reading and other student resources are contained in the textbook and on the course on-line site (e-class). Formal announcements made to the class may be subsequently posted on the course on-line site.

The key difference in ENGM 620 with respect to ENGM 401 is a greater emphasis on investment analysis for technology companies. Students in ENGM 620 form small groups to research the financial valuation of a publicly traded company and its performance in the market. A mandatory seminar series in ENGM 620 introduces topics on investment analysis; and later in the course, each group presents their assessment in a formal presentation to the class during the Wednesday evening time slot. Each ENGM 620 student also submits a report (of no more than ten pages) of their section of the project. An alternative topic for the report may be selected, subject to approval by the instructor, for a short report on a topic in engineering finance.

2) Required Textbooks and Other Major Course Materials

Course Text (required):

- P. Flynn, *Financial Management for Engineers*, 4th Edition. Castle Rock Research Group. (Errata in the 4th edition of the course text are posted on-line.)

Additional Reading (strictly optional, NOT required):

- D. G. Newnan, J. Whittaker, T. G. Eschenbach, J. P. Lavelle, *Engineering Economic Analysis, Canadian Edition*, Oxford University Press, Don Mills, ON, 2006. (ISBN 0-19-541925-1) (lots of example problems)
- L. M. Fraser, A. Ormiston, *Understanding Financial Statements*, 8th Edition, Pearson Prentice Hall, Upper Saddle River, NJ, 2006. (ISBN 0-13-187856-5)

Other resources available on the on-line site include: Frequently Asked Questions (FAQ), a guide on how to do the financial calculations presented in the course, a set of examples used in class, sample midterms, glossary of some of the terms used in the course, a list of errata in the 4th edition of the course text, a discussion of other topics in engineering management & a reading list for interested students, and other relevant material (such as tools for skeptical thinking developed by Carl Sagan).

All overheads and notes for the course are subject to copyright. Reproduction for distribution other than for your personal use is prohibited unless explicit specific permission is granted.

Recording of lectures is prohibited unless part of an approved accommodation, or unless there is prior written approval from the course instructor.

3) Any Other Course Fees

None.

4) Access to the Instructor and Teaching Assistants

There are three teaching assistants (TAs) for this section of ENGM 401 and ENGM 620 combined. Your primary TA is based on the first letter of your family name (as noted below). The TAs are completely familiar with the course material (having taken the course themselves!); and so your first contact for questions about course material or an assignment should be with your teaching assistant, either during their office hours or by email. Of course, you are welcome to contact the instructor if you do not get prompt service from your TA. If you have questions about fairness in grading an assignment, or an issue about the course, then you should contact the instructor.

Instructor: MG Lipsett, Ph.D. P.Eng.

Professor, Ernest & Gertrude Poole Chair in Management for Engineers
Department of Mechanical Engineering, Engineering Management Group

Telephone: 780-492-9494

Email: Michael (dot) Lipsett (at) ualberta (dot) ca

Office: 5-8J Mechanical Engineering Building (5th Floor West)

Office Hours: Wednesdays 1:00 p.m. to 3:00 p.m. (or by appointment)

I can be consulted at other times whenever my office door is open; however, I may ask that you make an appointment for a later time. Emails will be answered, but instant response is not guaranteed. Answers to new questions may be posted on the course FAQ, for the benefit of all. (So please check the FAQ on the on-line site first.)

Teaching Assistants:

Waqas Awan (for students with family names A-G). Email: wawan (at) ualberta (dot) ca
Patrick Miller (for students with family names H-R). Email: pemiller (at) ualberta (dot) ca

Mayank Pandey (for students with family names S-Z). Email: mayank (at) ualberta (dot) ca

Office hours for TAs are yet to be determined and will be announced in class.

5) Distribution of Weight between Term Work and Examinations, and Identification of All Course Activities Worth 10% or More of the Overall Course Mark

ENGM 401 Marking Scheme:

Assignments*:	18%
Individual Projects:	12%
Midterm Exam #1:	20%

Midterm Exam #2:	25%	
Midterm Exam #3:	25%	
ENGM 620 Marking Scheme:		
Assignments*:	18%	
Individual Projects:		12%
Team Project (seminar presentation):	8%	
Individual report on section of team project or an approved topic in engineering finance	7%	
Midterm Exam #1:	15%	
Midterm Exam #2:	20%	
Midterm Exam #3:	20%	

*Assignments are due **in class** and cannot be accepted after solutions have been distributed. Assignments can be handed in early to the instructor. There is an assignment drop box near the Mechanical Engineering office on the fourth floor of the mechanical Engineering Building. It is labeled ENGM 401 X1, but it is also for ENGM 620 X1.

Re-exam rule: If a re-exam is granted, the exam will be comprehensive (i.e., use material from the entire course as covered in that lecture section) and the exam mark will replace the combined mark of all midterm exams given in the course. The rest of the term work (projects, assignments, etc.) will contribute to the new grade as before in the same fraction.

If a student misses a midterm for a documented and accepted reason (medical or personal emergency), then other midterm marks will be scaled proportionally to yield the overall contribution to the final mark from examinations.

6) Whether Marks Are Given for Class Participation and Other In-Class Activities

Students are encouraged to participate in class. There are no marks specifically allocated for participation.

7) Dates of Any Examination and Course Assignments with a Weight of 10% or More of the Overall Course Mark

This section of ENMG 401 and ENGM 620 has three midterm examinations and no final examination:

Thursday Oct. 6, 2011: **Midterm #1 (held in the regular class time slot in the regular classroom)**

Monday Nov. 7, 2011: **Midterm Exam #2 (also held in class)**

Monday Dec. 5, 2011: **Midterm Exam #3 (also held in class)**

The examinations are not strictly cumulative. For example, material in midterm 3 focuses primarily on material presented in the third part of the course, not the entire course; but the content in the three parts of the course are not mutually exclusive and tend to build on previous material, and so concepts introduced in one part of the course often reappear later in the course.

No single course assignment is worth more than 10% of the overall course mark.

8) The Manner in Which the Official University Grading System Is to Be Implemented

Marks in this section of ENGM 401 are scaled. Marks in ENGM 620 are also scaled. Each is done separately, and so undergraduate students are not assessed relative to graduate students.

9) How Students Will Be Given Access to Past or Representative Evaluative Course Material

There is a sample midterm for each of the three midterms in this course, posted online. There are examples of seminar presentations posted online. There are example problems posted online. There are example multiple-choice and true-false questions presented and discussed during lectures, also posted online. There are examples of long-answer assignment questions in the course text. Solution guides will be distributed after assignments have been submitted, to provide feedback on how assignment questions should be answered.

Outline of Course Lectures, Assignments (Including Projects), and Exams (Subject to Change), and How Late or Missed Work Is Dealt With:

Week 1:

Wednesday Sept. 7, 2011: Lecture #1 [Course Introduction](#) and [ENGM 620 Seminar Introduction](#)

Thursday Sept. 8, 2011: Lecture #2 [Engineering, Business, and Society](#)

Week 2:

Monday Sept. 12, 2011: Lecture #3 [Introduction to Financial Statements](#)

Wednesday Sept. 14, 2011: Lecture #4 [Income Statements](#) ; ENGM 620 [Seminar: Intro to Cash Flow Statements](#) ; [Annotated Seminar](#)

Thursday Sept. 15, 2011: Lecture #5 [Income Statements \(2\)](#)

Week 3:

Monday Sept. 19, 2011: Lecture #6 [Income Statements \(3\)](#)

Wednesday Sept. 21, 2011: Lecture #7 [Depreciation \(1\)](#); ENGM 620 [Seminar: Some Reflections on Poverty \(presented by Peter Flynn\)](#)

Thursday Sept. 22, 2011: Lecture #8 [Depreciation \(2\)](#);

Week 4:

Monday Sept. 26, 2011: Lecture #9 [Income Statements \(4\)](#)

Wednesday Sept. 28, 2011: Lecture #10 [After Tax Cash Flow](#); ENGM 620 Seminar: Risk Management (presented by Cesar Poveda)

Thursday Sept. 29, 2011: Lecture #11 [Balance Sheets \(1\)](#)

Week 5:

Monday Oct. 3, 2011: No lecture

Wednesday Oct. 5, 2011: Lecture #12 [Balance Sheets \(2\)](#) (this lecture includes Midterm preview & some tips); no ENGM 620 seminar

Remember to do [Sample Midterm #1](#)!

Thursday Oct. 6, 2011: **Midterm #1 (in class)**

(Friday Oct. 7, 2011: Fall Term Refund Deadline: Students withdrawing after this date will be assessed full fees.)

Week 6:

Monday Oct. 10, 2011: **Statutory Holiday: No lecture**

Wednesday Oct. 12, 2011: Lecture #13 [Leverage](#)

Thursday Oct. 13, 2011: Lecture #14 [Leverage \(2\) & Introduction to Sources & Uses of Funds](#)

Week 7:

Monday Oct. 17, 2011: Lecture #15 [Cash Flow Statements](#); midterm review

Wednesday Oct. 19, 2011: **Project #1 due at start of class** Lecture #16 [Cash Flow Statements \(2\)](#); ENGM 620 student seminars

Thursday Oct. 20, 2011: Lecture #17 [Ratio Analysis](#)

Week 8:

Monday Oct. 24, 2011: Lecture #18 [Ratio Analysis \(2\)](#)

Wednesday Oct. 26, 2011: Lecture #19 Introduction to Valuation; ENGM 620 student seminars

Thursday Oct. 27, 2011: Lecture #20 [Time Value of Money](#)

Week 9:

Monday Oct. 31, 2011: Lecture #21 [Time Value of Money \(2\)](#)

Wednesday Nov. 2, 2011: Lecture #22 [Interest Calculations](#); ENGM 620 student seminars

Thursday Nov. 3, 2011: Lecture #23 [Interest Calculations \(2\)](#) and (brief) midterm preview

Remember to do [Sample Midterm #2!](#)

Week 10:

Monday Nov. 7, 2011: **Midterm Exam #2 (in class)**

Wednesday Nov. 9, 2011: Lecture #24 [Interest Calculations \(3\)](#) & [Inflation](#); ENGM 620 student seminars. (Last day for withdrawal from Fall Term courses.)

Thursday Nov. 10, 2011: **Fall term break: No lecture**

Week 11:

Monday Nov. 14, 2011: Lecture #25 [Present Worth Analysis](#); midterm review

Wednesday Nov. 16, 2011: Lecture #26 [Present Worth Analysis \(2\)](#); ENGM 620 student seminars

Thursday Nov. 17, 2011: Lecture #27 [Rate of Return](#)

Week 12:

Monday Nov. 21, 2011: Lecture #28 [Other Analysis Techniques](#)

Wednesday Nov. 23, 2011: **Project #2 due at the start of class** Lecture #29; Other Analysis Techniques (2); ENGM 620 student seminars

Thursday Nov. 24, 2011: Lecture #30 [Sensitivity Analysis & Uncertainty](#)

Week 13:

Monday Nov. 28, 2011: Lecture #31 [Decision Analysis](#)

Wednesday Nov. 30, 2011: Lecture #32 [Valuation \(2\)](#) (intro to Real Options Valuation and Quants); ENGM 620 seminar: Intro to Quantitative Finance Methods

Thursday Dec. 1, 2011: Lecture #33 [Course review](#)
Remember to do [Sample Midterm #3!](#)

Week 14:

Monday Dec. 5, 2011: **Midterm Exam #3 (in class)**

Wednesday Dec. 7, 2011: [Personal Finance for Engineers](#) (P. Flynn)

Assignments:

Note that assignment problem numbers from the course text refer to the fourth edition of the text.

Assignments are due in class. There is an assignment drop box near the Mechanical Engineering office on the fourth floor of the Mechanical Engineering Building. It is labeled ENGM 401 X1, but it is also for ENGM 620 Section X1.

There is no specific format for assignment submissions: typed and handwritten are both acceptable. But neatness counts! (That's part of being a professional.) If the TA cannot read your writing, or follow the logic of your solution, then you will likely lose marks. Make sure that you put your proper name and student number on your assignment so that you get credit for the work that you have done.

Please respect the "48 Hour" rule: do not automatically contact the TA (or instructor) if your mark is not what you expected. Review the solution guide, and only contact the TA if there is indeed an issue.

[Assignment #1](#): Assigned on Sept. 7, 2011, due in class on Sept. 15, 2011

[Assignment #2](#): Assigned on Sept. 15, 2011, due in class on Sept. 22, 2011

[Assignment #3](#): Assigned on Sept. 22, 2011, due in class on Sept. 29, 2011

[Assignment #4](#): Assigned on Sept. 29, 2010, due in class on Oct. 12, 2011

[Assignment #5](#): Assigned on Oct. 6, 2011, due in class on Oct. 17, 2011 (this is a short assignment reflecting the fact that there is also a project to do)

[Assignment #6](#): Assigned on Oct. 17, 2011, due in class on Oct. 24, 2011

[Assignment #7](#): Assigned on Oct. 24, 2011, due in class on Nov. 3, 2011

[Assignment #8](#): Assigned on Nov. 3, 2011, due in class on Nov. 14, 2011 (no assignment the following week to allow for project work)

[Assignment #9](#): Assigned on Nov. 21, 2011, due in class on Nov. 30, 2011

Marked assignments will be handed back in class and then can be picked outside the instructor's office at MEC E 5-8J.

Project assignment:

Projects are more substantial assignments, involving more detailed analysis and interpretation. Projects are to be done individually and without help. Projects will be handed out (not available on-line), and the handout must be submitted as part of the project, or the project will not be marked.

Project #1: Will be handed out in class on Oct. 6, 2011, due at the start of class on Oct. 19, 2011.

Project #1: Will be handed out in class on Nov. 14, 2011, due at the start of class on Wednesday, Nov. 23, 2011. Projects will only be accepted late due to a documented medical or personal emergency, where “late” is after 5:10 pm on the classroom clock (when the TA leaves with the projects). A project that is otherwise late will have a penalty:

- 10% penalty within first 24 hours after the due date and time
- 30% between 24 and 48 hours after the due date and time,
- 60% penalty between 48 and 72 hours after the due date and time, and
- not accepted after 72 hours beyond the due date & time without a justified reason.

Course Feedback (and Optional Assignment):

Good managers are committed to effective interactions with the people they work with. It is critical that there be good lines of communication, not only for stating expectations but also for accepting feedback on performance. Of course, this communication has to go both ways to be effective: the employee has to trust the manager to accept feedback non-judgmentally.

In this course, the instructor welcomes constructive feedback (which can be positive or negative) and any suggestions for improvements to the course. Discussion during the class can significantly improve the learning experience. If you have a question for clarification or a relevant comment (or if the instructor has made an error...), please share it with the class.

Feedback can also be submitted to substitute for one missed assignment, or to improve the mark of a single assignment. Please refer to the list of topics for feedback available on the on-line site. Course feedback in lieu of a missed assignment, or to improve one assignment mark must be handed in by the end of the last day of class at the latest. Feedback can be submitted in a sealed envelope, not to be opened until after the marks have been submitted, so that there will be no possibility that critical feedback can affect the final mark.

Note:

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.ualberta.ca/secretariat/appeals.htm) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.